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# PHILOSOPHICAL TRANSACTIONS.

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Februar. 20. 1671.

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*Extract of a Letter, written by Mr. John Wray to the Publisher January 13. 1670. Concerning some un-common Observations and Experiments made with an Acid Juice to be found in Ants.*

SIR, What I now send you concerning the Juice of Pismires, I received not long since from Dr. Hulse and Mr. Samuel Fisher. The Observations sent me by Mr. Hulse the tenth of  
Oo  
August

*August* last past, are these. Lately (saith he) consulting *Langhams Garden of Health*, I met with this passage : *Cast the flowers of Cichory among an heap of Ants, and they will soon become as red as blond.* Note, that *Langham* was not the first, that made or published this Observation : I find it deliver'd by *Hieronymus Tragus Hist. Stirp. l. 1. c. 91. Naturæ miraculum in hoc flore observare licet ; siquidem cumulo Formicarum abditus, Cæruleum colorem in rubrum mutat, ac siterrere illarum erubesceret.* And before him, it was taken notice of by *Otho Brunfelsius*, as *Johannes Bauhinus* observes. I presently got some Cichory flowers, and made the Experiment, and find it to be true what he saith; only he takes no notice of the manner, how the flowers come to be stain'd : which therefore take as follows. Bare an Ant hill with a stick, and then cast the flowers upon it, and you shall see the Ants creep very thick over them. Now as they creep, they let fall a drop of liquor from them, and where that chanceth to light, there you shall have in a moment a large red stain. Sometimes they will be a pretty while before they discolour them, and at other times they will do it suddenly. At the first I guessed, that being vext by stirring their hill, they might thrust their stings into the flowers, and thorow them convey that sharp liquor : But by bruising them, and rubbing the expressed juyce against the flowers, I find they will be equally stained. 'Tis a thing well known, that Ants, if they get into peoples clothes, and so to their skin, will cause a smart and tingling, as if they were netted; which I conceive is done by letting fall the fore-mentioned corrosive liquor, rather than by stinging.

To what sort of liquor to refer this Juyce, I know not. I dropt *Spirit of Salt*, and *Oyl of Sulphur* upon the Flowers, but they did not cause them to change colour. \* I likewise put *Salt of Tartar* upon them, and dropt thereon a little *Spirit of Salt*, which caused a sufficient fermentation, but prevailed not to change the colour of the flowers in the least.

This Observation holds true not only in *Cichory flowers*, and, I suppose, all others of a *Bleu* colour. It were worth the while to try, Whether that sharp liquor, which *Mr. Hook* saith is in the stings of Bees, if it may be got out by thrusting them into the

\* See the Postscript of this Letter.

the leaves of Flowers, will not cause a stain. *So far the Doctor.*

Upon reading these passages, I called to mind an Experiment, which some years since *Mr. Samuel Fisher* of *Sheffield* had made me acquainted with, *viz.* If with a staff or other instrument you stir an heap of Ants, (especially *Hor(e)-Ants*,) so as to anger them, they will let fall thereon a liquor, which if you presently smell to, will twinge the Nose like newly distilled *Spirit of Vitriol*. Considering this, and likewise that a few drops of the Oil or *Spirit of Vitriol* will soon turn the blewish *Syrup of Violets* into a bright red; and, as I am credibly informed, the juyces and tinctures of any other flowers or fruits of that or the like colour, I was easily induced to think, that this juyce of Pismires might be of the same nature with the Oyl of Vitriol, and other Acid Spirits, (which have in the fore-mentioned respects the same effects with that Oyl:) And thereupon I sent to inquire of *Mr. Fisher*, what Trials he had made of it, who return'd me this following account.

A weak Spirit of Pismires will turn Borage flowers red in an instant: Vinegar, a little heated, will do the like. Pismires distilled by themselves, or with water, yield a Spirit like Spirit of Vinegar, or rather like the Spirit of *Viride æris*. Lead put into this Spirit, or fair water, with the Animals themselves being alive, maketh a good *Saccharum Saturni*: Iron put into the Spirit, affords an Astringent tincture, and by repetition a *Crocus Martis*. Take *Saccharum Saturni*, thus made, and distil it, and it will afford the same Acid Spirit again, which the *Saccharum Saturni* made with Vinegar will not do, but returns an inflammable Oyl with water, and nothing that is Acid. *Saccharum saturni* made with *Viride æris*, doth the same (in this respect) with that made with Spirit of Pismires.

When you put the Animals into water, you must stir them to make them angry, and then they will spirt out their acid juyce. No Animal that ever we distilled (he speaks of his Brother and himself) except this, yields an Acid Spirit, but constantly an *Urinous*; and yet we have distilled many, both Flesh, Fish, and Insects.

*Hitherto Mr. Fisher*, who desires to be inform'd, whether any ingenious person, conversant in these inquiries, hath either

himself sound out, or heard of any other *animal*, that by distillation or otherwise yields an Acid spirit. For my part, I know of none; but if any do, they are probably the *favifcous* and *gregarious* kind, and generally such as are furnish'd with stings; of which weapon Pismires are not unprovided. Indeed it seems strange, that Nature should prepare and separate in the Body of this Insect without any sensible heat, and that in good quantity, considering the bulk of the *animal*, a liquor the same for kind with those Acid Spirits, which are by Art extracted out of some Minerals not without great force of Fire.

I doubt not but this liquor may be of singular use in Medicine. *Mr. Fisher* hath assured me, that himself hath made trial thereof in some diseases with very good success.

*Postscript.*

WHereas in the former account there is a passage liable to exception and mistake, *viz. Spirit of Salt and Oyl of Sulphur, drop'd upon Cichory-flowers, did not cause them to change colour*; for the clearing thereof you may please to take notice, that it is to be understood of the flowers entire and unbruised: For any Blew flowers being a little bruised, and then a drop of Spirit of Salt or any other Acid Spirit let fall thereon, will turn instantly red. The reason is obvious; for that the leaves of the Flowers (as all the other parts of the plant) being invested with a skin or Membrane, the liquor dropp'd thereon cannot easily penetrate it, and so commix it self with the interior juyce or pulp. Hence it is, that if these flowers be put into cold Vinegar, especially if the weather be cool, they will not change colour for a considerable time; but if you heat the Vinegar, they will change immediately.

Whether the Ants do only drop this Tinging liquor upon the surface of the flowers, or thrusting their stings into the body of the flower, do by them convey it immediately into the interior included Juyce, we cannot yet determine, but refer to future observation, when the time of the year will afford us flowers.